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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/553,983

Applicant(s)

SAWAI ET AL.

Examiner

Demetrius R. Pretlow

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 18-22 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-4, 12 and 14-16 is/are allowed.
- 6) ☒ Claim(s) 5-9 is/are rejected.
- 7) ☒ Claim(s) 10, 11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 September 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/20/05</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the deformed shape model producing unit, reference shape model producing unit, superimposition calculating unit and a twist angle calculating unit in claim 12, and main wire member deformed shape model producing unit, main wire member reference shape model producing unit, main wire member angle calculating unit, sub wire member deformed shape model producing unit, sub wire member reference shape model producing unit, subwire member angle calculating unit and a twist angle calculating unit in claim 16 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an

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application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 13 and 17 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. In claims 13 and 17, line 1, the program is not stored or embedded in a computer readable medium .

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 5 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Hughes et al. (US 5,506,950). In reference to claim 5, Hughes et al. teach a finite element model producing step of producing a finite element model of the wire-like structure while assuming that the wire-like structure is an elastic body in which a

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plurality of beam elements are coupled together. Note claim 1, lines 7-13 and Figure 1(b). Hughes et al. teach a deforming (unfolding) step of deforming the wire-like structure to a reference shape in which the main wire bundle exists in a predetermined plane, by applying shape and material properties and restraint conditions of the wire-like structure to the finite element model; Note column 5, lines 29-34, and column 4, lines 45-54. Hughes et al. teach a twist angle calculating step of calculating angles which are formed by the sub wire bundles with respect to the plane, as the twist angles. Note column 3, lines 11-25.

In reference to claim 6, Hughes et al. teach wherein the restraint conditions corresponding to the reference shape are set so that the main wire bundle is linearly stretched. Note column 5, lines 29-34 and Figure 2 and Figure 3.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes et al. (US 5,506,950) in view of Ozaki (US 2003/0050723). Hughes teach the limitations above.

In reference to claim 7, Hughes does not teach wherein the plane is a reference plane in which a jig plate that is to be used in production of the wire-like structure is supposed.

Ozaki teach wherein the plane is a reference plane in which a jig plate that is to be used in production of the wire-like structure is supposed. Note paragraph 147, line 6.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the invention of Hughes et al. to include the teaching of Ozaki because it would assist in wire harness design. Note paragraph 9, line 2.

In reference to claim 8, Hughes et al. does not teach the main wire bundle has a largest diameter among all wire bundles constituting the wire-like structure.

Ozaki teach the main wire bundle has a largest diameter among all wire bundles constituting the wire-like structure. Note paragraph 154.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the invention of Hughes et al. to include the teaching of Ozaki because it would assist in wire harness design. Note paragraph 9, line 2.

Ozaki does not teach wherein the restraint conditions are set so that a wire bundle which, among the sub wire bundles, is next in thickness to the main wire bundle exists in the reference plane. Note paragraph 154.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the invention of Hughes et al. to include the teaching of Ozaki because it would assist in wire harness design. Note paragraph 9, line 2.

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Claims 10 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In reference to claim 10 the prior art of record does not teach the inclusion of the limitations of an the wire-like structure includes a clamp which is attached to the main wire bundle, and which can produce a twist; and an angle which is formed by a rotation axis of the clamp with respect to the plane is calculated as the twist angle. It is these limitations found in each of the claims, as they are **claimed in the combination**, that has not been found, taught or suggested by the prior art of record.

In reference to claim 11 the prior art of record does not teach the inclusion of the limitations of an the wire-like structure includes, in place of the sub wire bundles, clamp which is attached to the main wire bundle, and which can produce a twist; and an angle which is formed by a rotation axis of the clamp, in place of the sub wire bundles, with respect to the plane is calculated as the twist angle. It is these limitations found in each of the claims, as they are **claimed in the combination**, that has not been found, taught or suggested by the prior art of record.

Claims 13 and 17 would be allowed if formal matters above are overcome.

In reference to claim 13 the prior art of record does not teach the inclusion of the limitations of an a deformed shape model producing unit that produces a deformed shape model in which the main wire bundle of the wire-like structure is expressed as a coupled member of a plurality of beam elements so as to correspond to the deformed

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shape, and a clamp axis corresponding to a rotation axis of the clamp and/or a virtual clamp axis corresponding to a branching direction of the sub wire bundle is added to each of a clamp attachment node and/or sub wire bundle branch node of the main wire bundle; a reference shape model producing unit that produces a reference shape model in which the main wire bundle of the wire-like structure is expressed as a coupled member of a plurality of beam elements so as to correspond to the reference shape, and a predetermined reference axis is added to a clamp attachment node and/or sub wire bundle branch node of the main wire bundle; a superimposition calculating unit that calculates a shape obtained by deforming the reference shape model and superimposing the deformed reference shape model on the deformed shape model, with using a finite element method, while referring shape and material properties of the wire-like structure; and a twist angle calculating unit that calculates an angle formed by the reference axis, and the clamp axis and/or the virtual clamp axis, as the twist angle, after calculation by the superimposition calculating unit. It is these limitations found in each of the claims, as they are **claimed in the combination**, that has not been found, taught or suggested by the prior art of record.

In reference to claim 17 the prior art of record does not teach the inclusion of the limitations of an a main wire member angle calculating unit that calculates a first twist angle while referring physical properties of the wire-like structure, with using a finite element method, the first twist angle being an angle which is formed by the first reference axis and the branch axis when the main wire member reference shape model is deformed and then superimposed on the main wire member deformed shape model;



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a sub wire member deformed shape model producing unit that produces a sub wire member deformed shape model in which a deformed shape of the sub wire member is expressed as a coupled member of a plurality of beam elements, and a clamp axis for obtaining a twist angle of the clamp is added to a clamp attachment node on the sub wire member; a sub wire member reference shape model producing unit that produces a sub wire member reference shape model in which the sub wire member is expressed as a coupled member of a plurality of beam elements so as to correspond to a sub wire member reference shape that is a shape obtained by straightly stretching the sub wire member without being twisted, and a second reference axis which functions as a reference for obtaining a twist angle of the clamp axis is added to a position corresponding to the clamp axis; a sub wire member angle calculating unit that calculates a second twist angle while referring physical properties of the wire-like structure, with using a finite element method, the second twist angle being an angle which is formed by the second reference axis and the clamp axis when the sub wire member reference shape model is deformed and then superimposed on the sub wire member deformed shape model; and a twist angle calculating unit that corrects the second twist angle on the basis of the first twist angle to obtain an angle formed by the first reference axis and the clamp axis . It is these limitations found in each of the claims, as they are **claimed in the combination**, that has not been found, taught or suggested by the prior art of record.

***Allowable Subject Matter***

Claims 1-4,12,14-16 allowed.

The best prior art of record particularly Hughes et al.(US 5,506,950) teach a computer implemented method for designing a form board for manufacturing a wire harness is used to convert a three dimensional computer representation of a wire harness into a two dimensional model of the harness, however Hughes et al. does not teach the following claim limitations.

The primary reason for the allowance of claims 1-4 is the inclusion of the method steps of a deformed shape model producing step of producing a deformed shape model in which the main wire bundle of the wire-like structure is expressed as a coupled member of a plurality of beam elements so as to correspond to the deformed shape, and a clamp axis corresponding to a rotation axis of the clamp and/or a virtual clamp axis corresponding to a branching direction of the sub wire bundle is added to each of a clamp attachment node and/or sub wire bundle branch node of the main wire bundle; a superimposition calculating step of, with using a finite element method, calculating a shape obtained by deforming the reference shape model and superimposing the deformed reference shape, model on the deformed shape model, while referring shape and material properties of the wire-like structure; and a twist angle calculating step of, after the superimposition calculating step, calculating an angle formed by the reference axis, and the clamp axis and/or the virtual clamp axis, as the twist angle. It is this step found in each of the claims, as it is **claimed in the combination**, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

The primary reason for the allowance of claim 14 is the inclusion of the method step of a main wire member angle calculating step of , with using a finite element method, calculating a first twist angle while referring physical properties of the wire-like structure, the first twist angle being an angle which is formed by the first reference axis and the branch axis when the main wire member reference shape model is deformed and then superimposed on the main wire member deformed shape model; a sub wire member deformed shape model producing step of producing a sub wire member deformed shape model in which a deformed shape of the sub wire member is expressed as a coupled member of a plurality of beam elements, and a clamp axis for obtaining a twist angle of the clamp is added to a clamp attachment node on the sub wire member; a sub wire member reference shape model producing step of producing a sub wire member reference shape model in which the sub wire member is expressed as a coupled member of a plurality of beam elements so as to correspond to a sub wire member reference shape that is a shape obtained by straightly stretching the sub wire member without being twisted, and a second reference axis which functions as a reference for obtaining a twist angle of the clamp axis is added to a position corresponding to the clamp axis; a sub wire member angle calculating step of, with using a finite element method, calculating a second twist angle while referring physical properties of the wire-like structure, the second twist angle being an angle which is formed by the second reference axis and the clamp axis when the sub wire member reference shape model is deformed and then superimposed on the sub wire member deformed shape model; and a twist angle calculating step of correcting the second twist

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angle on the basis of the twist angle to obtain an angle formed by the reference axis and the clamp axis. It is these step found in each of the claims, as it is **claimed in the combination**, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

The primary reason for the allowance of claims 15 is the inclusion of the method steps of a main wire member angle calculating step of, with using a finite element method, calculating a first twist angle while referring physical properties of the wire-like structure, the first twist angle being an angle which is formed by the first reference axis and the first branch axis when the main wire member reference shape model is formed and then superimposed on the main wire member deformed shape model; a sub wire member deformed shape model producing step of producing a sub wire member deformed shape model in which a deformed shape of the sub wire member is expressed as a coupled member of a plurality of beam elements, and a second branch axis-for obtaining a twist angle of the second sub wire member is added to a second wire member branch node on the sub wire member; a sub wire member reference shape model producing step of producing a sub wire member reference shape model in which the sub wire member is expressed as a coupled member of a plurality of beam elements so as to correspond to a sub wire member reference shape that is a shape obtained by straightly stretching the sub wire member without being twisted, and a second reference axis which functions as a reference for obtaining a twist angle of the second branch axis is added to a position corresponding to the second wire member branch node; a main wire member angle calculating step of, with using a finite element

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method, calculating a second twist angle while referring physical properties of the wire-like structure, the second twist angle being an angle which is formed by the second reference axis and the second branch axis when the sub wire member reference shape model is deformed and then superimposed on the sub wire member deformed shape model; and a twist angle calculating step of correcting the second twist angle on the basis of the first twist angle to obtain an angle formed by the first reference axis and the second branch axis. It is this step found in each of the claims, as it is **claimed in the combination**, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

The primary reason for the allowance of claim 12 is the inclusion of the limitations of an a deformed shape model producing unit that produces a deformed shape model in which the main wire bundle of the wire-like structure is expressed as a coupled member of a plurality of beam elements so as to correspond to the deformed shape, and a clamp axis corresponding to a rotation axis of the clamp and/or a virtual clamp axis corresponding to a branching direction of the sub wire bundle is added to each of a clamp attachment node and/or sub wire bundle branch node of the main wire bundle; a reference shape model producing unit that produces a reference shape model in which the main wire bundle of the wire-like structure is expressed as a coupled member of a plurality of beam elements so as to correspond to the reference shape, and a predetermined reference axis is added to a clamp attachment node and/or sub wire bundle branch node of the main wire bundle; a superimposition calculating unit that calculates a shape obtained by deforming the reference shape model and

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superimposing the deformed reference shape model on the deformed shape model, with using a finite element method, while referring shape and material properties of the wire-like structure; and a twist angle calculating unit that calculates an angle formed by the reference axis, and the clamp axis and/or the virtual clamp axis, as the twist angle, after calculation by the superimposition calculating unit. . It is these limitations found in each of the claims, as they are **claimed in the combination**, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

The primary reason for the allowance of claims 16 is the inclusion of the limitations of an a main wire member angle calculating unit that calculates a first twist angle while referring physical properties of the wire-like structure, with using a finite element method, the first twist angle being an angle which is formed by the first reference axis and the branch axis when the main wire member reference shape model is deformed and then superimposed on the main wire member deformed shape model; a sub wire member deformed shape model producing unit that produces a sub wire member deformed shape model in which a deformed shape of the sub wire member is expressed as a coupled member of a plurality of beam elements, and a clamp axis for obtaining a twist angle of the clamp is added to a clamp attachment node on the sub wire member; a sub wire member reference shape model producing unit that produces a sub wire member reference shape model in which the sub wire member is expressed as a coupled member of a plurality of beam elements so as to correspond to a sub wire member reference shape that is a shape obtained by straightly stretching the sub wire

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member without being twisted, and a second reference axis which functions as a reference for obtaining a twist angle of the clamp axis is added to a position corresponding to the clamp axis; a sub wire member angle calculating unit that calculates a second twist angle while referring physical properties of the wire-like structure, with using a finite element method, the second twist angle being an angle which is formed by the second reference axis and the clamp axis when the sub wire member reference shape model is deformed and then superimposed on the sub wire member deformed shape model; and a twist angle calculating unit that corrects the second twist angle on the basis of the first twist angle to obtain an angle formed by the first reference axis and the clamp axis. It is these limitations found in each of the claims, as they are **claimed in the combination**, that has not been found, taught or suggested by the prior art of record which makes these claims allowable over the prior art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Demetrius R. Pretlow whose telephone number is (571) 272-2278. The examiner can normally be reached on Mon.-Fri. 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Demetrius R. Pretlow

Patent Examiner

*Demetrius Pretlow* 5/22/07

